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ABSTRACT

This study compares the face-to-face interaction of infants with fathers to their interaction with mothers and with strangers. Five infants were videotaped in individual interaction with their mothers, fathers, and unfamiliar adults at weekly intervals from the second week until the infants were 6 months old. Infants were seated in a laboratory setting with the parent or stranger opposite. Sixteen sessions, each consisting of a 2-minute period of "playful" communication with the adult, were examined for differences in interaction. The film demonstrated that infants display a different behavioral repertoire and have a different expectancy for interaction with fathers as compared with mothers and strangers. A further second-by-second slow motion videotape analysis was conducted utilizing the following infant and adult categories: gaze patterns, limb movements, body positions, facial expressions, vocalizations, and touching patterns. Results indicated that differences in infant response to fathers, mothers and strangers are apparent as early as 4 weeks. In addition, the responses suggest that infants expect and elicit different kinds of interaction with different adults: with mothers, a reciprocal, contained type of interaction, while with fathers, a more heightened, alert, playful interaction. In contrast, the stranger serves as a source for cautiously testing newly acquired social skills. The unique roles mothers and fathers can play with young infants are stressed. (CM)

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FATHER-INFANT INTERACTION

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The research I will describe today represents a beginning attempt to understand the unique qualities of the developing relationship of infants with fathers. Our objective is to describe the patterns of behavior displayed during social interactions and to specify the contributions made by both the infant and the father. In this report, I will focus on the infant's contributions. We began by comparing the face to face interaction of infants with fathers to their interaction with mothers and with strangers.

We hoped in this study to answer two specific questions: 1) Do infants act differently with fathers, mothers and strangers and if so, what is the quality of those differences? and 2) When do those differences first become apparent?

Our subjects were five healthy, first-born infants, their mothers, fathers and unfamiliar adults who served as strangers. We videotaped them in our laboratory at weekly intervals from the second week until the infants were six months old. Mothers were the primary caretakers in all families.

The laboratory setting may be seen in the first slide. (Fig. 1) Infants were seated comfortably in an infant seat. Parents and strangers sat down opposite the infant and were instructed to "play" without using toys. Each session consisted of one two minute period of "playful" communication with each adult. Frontal images of both adult and infant were simultaneously projected to a split screen monitor and recorded.

I would now like to show you a film of one of our sessions - an interaction between a three month old male infant and his mother, father and a stranger.

First, we will see a 30 second segment of the infant with his mother. I would like you to pay particular attention here to several aspects.

1) First, the reciprocal, varied and drawn out vocalizations between infant and mother which constitute a verbal game they both know, each in turn initiating and terminating it.

2) Second, the frequent broad smiles by the infant.

3) Third, the infant's movements of limbs, fingers and toes which alternately cycle smoothly towards and away from the mother, and underscore the rhythmic quality of the interaction. Notice the slow gradual accelerations and decelerations as mother and baby alternately build up and come down repeating the sequence together.

4) Fourth, note the touching patterns of the mother: her containment of the baby's movements by placing her arms and hands gently on his abdomen, which serve to modulate his movements and focus the interaction.

5) Fifth, note the repetitive high-pitched imitative baby talk the mother uses.

Next, we will see the first minute of the infant with father. Here note:

1) First, the frequent varied vocalizations by the baby - but now shorter, more intense- not part of the same reciprocal verbal game we saw with the mother.

2) Second, the same frequent broad smiles by the infant just as we saw with the mother.

3) Third, the more upright body posture and stillness of the infant. The limb movements that do occur are large and abrupt and seem to punctuate the interaction in a more staccato fashion in contrast to the cycling movements we saw with mother.

4) Finally, note the father's vocalizations which are a free-flowing narrative, his facial expressions with shifts in eyebrows to amplify the infant's responses, and his rhythmic touching patterns. Short bursts of tapping are an example of the abrupt shifts that characterize father-infant interaction, in which father and infant alternately accelerate to higher peaks and decelerate to lower valleys than do mother and infant.

Finally, we will see a 30 second segment with a stranger whom the infant has never met before.

1) Throughout, note the sparseness of the baby's vocalizations and smiles as compared with both mother and father.

2) Second, note the episodic, brief overtures the infant makes with looks, smiles and even vocalizations as he cautiously attempts to elicit interaction with the stranger. Finally, he withdraws.

3) As the withdrawal proceeds, note the change in the infant's body posture as he leans out of the seat and begins to play with an inanimate object, namely the strap of the infant seat.

4) Finally, note that the stranger sits far back with long silences and makes occasional tentative touches. It appears as if the stranger is trying to read the infant's cues but is confused by them and in turn gives confusing messages back.

In summary then, this film demonstrates that the infant displays a different behavioral repertoire and has a different expectancy for interaction with fathers as compared with mothers and strangers. We translated these clinical impressions into more quantitative analyzable data by using a microscopic method of second by second slow motion videotape analysis. For each second, we described for both the infant and the adult categories of gaze patterns, limb movements, body positions, facial expressions, vocalizations and touching patterns.

RESULTS

So far, we have analyzed a representative sample of 16 sessions for infants aged 10 days to 6 months. First of all, we calculated the percent of time all infants aged 0-6 months spent in each category of behavior with father as compared with mother and stranger. Many of the differences demonstrated in the movie can be shown to be statistically significant with a 2-tailed Wilcoxon test, $\alpha < 0.05$. For example, infants frowned four times as much with strangers as they did with either fathers or mothers. The

next slide shows these differences more clearly. (Fig. 2) The bar graphs show the percent of time the infant frowns with different adults - mother on the left, father in the middle and stranger on the right. You can see that infants spent much less time frowning with fathers (only 7.8%) than with strangers (28.2%), and spent about the same amount of time frowning with fathers (7.8%) as with mothers (5.3%). The infant's facial expressions were more positive with familiar adults, mothers and fathers, than with unfamiliar adults and these differences were significant at $p < 0.01$. We have documented the same kinds of statistically significant differences for infant smiles and for patterns of infant limb movement and vocalization. These differences were consistent for all five infants.

When does that differentiation begin? Clinically, the differences are apparent by four weeks. By two months, we have analyzed enough sessions to apply non-parametric statistical tests. This analysis shows statistically significant differences of the same patterns already described. The next slide, for example, (Fig. 3) shows the percent of time all infants spent frowning with mother, father and stranger before two months of age on the left, and from 2-6 months of age on the right. Looking just at the younger infants on the left, we can see that they frown significantly more with strangers than with mothers or fathers and that the pattern is consistent before and after two months of age.

Let me now summarize the data and try to answer the questions I posed at the beginning of this talk. First, very young babies are capable of responding to fathers, mothers and strangers with distinctly different behavioral displays and patterns of interaction. These differences were apparent as early as 4 weeks, and suggest that infants can differentiate father, mother and stranger at a younger age than much of the literature suggests. The infants' responses suggest that they expect and may elicit different kinds of interaction with different adults: with mothers - a reciprocal, contained type of interaction; while with fathers - a more heightened, alert playful interaction. Perhaps father, as a second familiar adult, provides an adaptive opportunity for the infant to learn about another dimension of himself as an individual separate and independent from the mother. In contrast, the unfamiliar stranger appears to serve as a source for cautiously testing newly acquired social skills.

As we expand our understanding of these differences, we as pediatricians can together with parents clarify the unique roles mothers and fathers can play with young infants and minimize some of the conflicts and competitions between parents that our present culture reinforces. In closing, we hope that further study of infant-father interaction will reshape theory to accommodate what infants and fathers have known all along - namely

that fathers have a unique, important and direct role to play with young infants, a role that complements the relationship with the mother, and a role that starts at birth.

Fig. 1

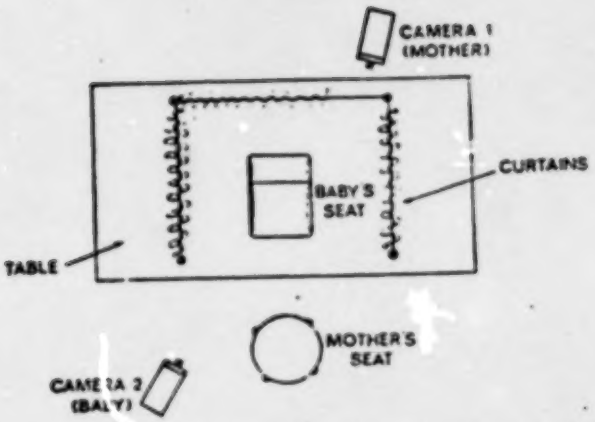

FIG. 1. Schema of laboratory during observations of mother-infant interaction.

Fig. 2

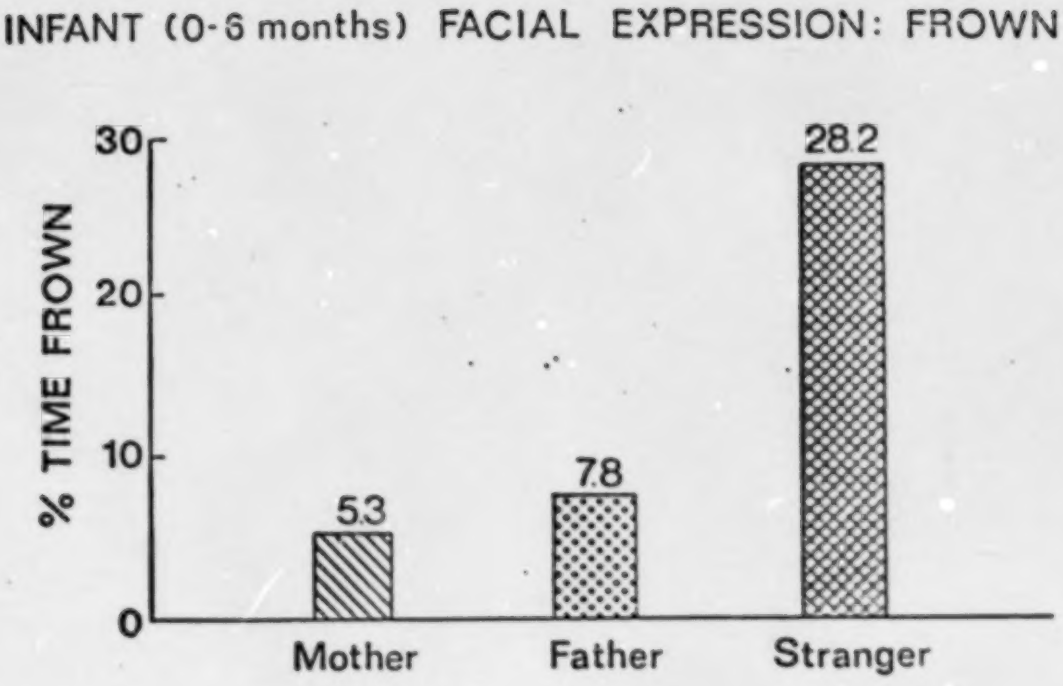

Figure 2: Percent of time infants frown with mother, father and stranger. Differences are statistically significant (Wilcoxon) between father and stranger ($p < 0.01$) and mother and stranger ($p < 0.01$).

Fig. 3

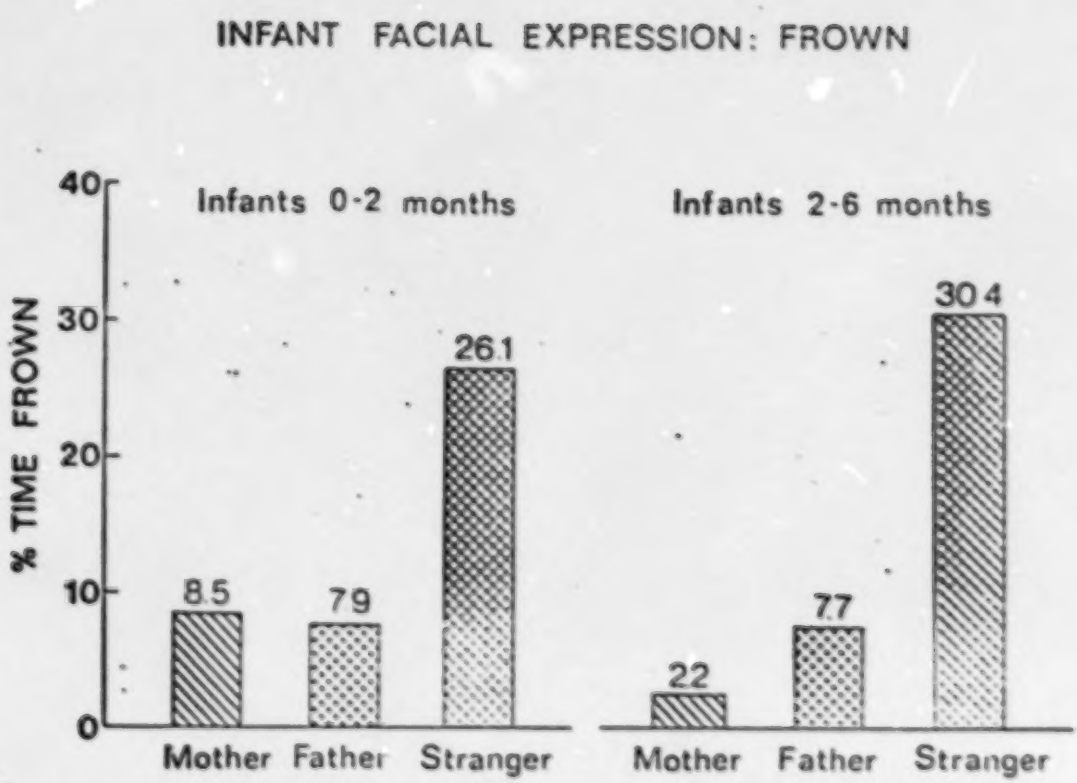

Figure 3 : Percent of time infants under 2 months and 2-6 months frown with mother, father and stranger. Differences are statistically significant (Wilcoxon) for younger infants (0-2 months): between mother and stranger ($p \leq 0.05$) and between father and stranger ($p \leq 0.05$); and for older infants (2-6 months): between father and stranger ($p < 0.05$) and between mother and father ($p < 0.05$).

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